

In the Claims

1. (Original) A power detector/controller for wireless handsets that use a modulation scheme having a non-constant amplitude envelope, the power detector/controller comprising:

    a power amplifier having an input to receive a input signal with non-constant amplitude envelope and an output to output an amplified input signal, wherein either output power or gain of the power amplifier is controlled by a power amplifier control signal;

    an output demodulating detector coupled to the output of the power amplifier to generate a feedback signal proportional to the amplified input signal's power, the feedback signal including an AM variation due to the non-constant amplitude envelope;

    a summing junction to receive the feedback signal, a ramp control signal that indicates either a target gain or target output power of the power amplifier, and an AM variation signal that represents the AM variation in the power of the input signal due to the non-constant amplitude envelope; and

    the summing junction combining the feedback signal, the ramp control signal and AM variation signal to produce the power amplifier control signal such that the power amplifier control signal substantially free of any AM variation due to the non-constant envelope.

2. (Original) A power detector/controller for wireless handsets that use a modulation scheme having a non-constant amplitude envelope, as per claim 1, further comprising:

    an input demodulating detector coupled to the input of the power amplifier to generate the AM variation signal received by the summing junction.

3. (Original) A power detector/controller for wireless handsets that use a modulation scheme having a non-constant amplitude envelope, as per claim 2, wherein the input demodulating detector is coupled to the input via a phase shifter.

4. (Original) A power detector/controller for wireless handsets that use a modulation scheme having a non-constant amplitude envelope, as per claim 2, wherein the summing junction comprises:

a variable gain amplifier operatively coupled to the input demodulating detector to receive the AM variation signal and adjust the amplitude of the AM variation signal;

a differential amplifier to receive the feedback signal on a negative input and to receive the ramp control signal on a positive input, the differential amplifier having a filter capacitor connected between the negative input and an output of the differential amplifier, the differential amplifier producing an error signal from the feedback signal and ramp control signal; and

a sum node to receive the AM variation signal from the variable gain amplifier and to receive the error signal, the sum node combining the received AM variation signal and error signal to produce the power amplifier control signal that is substantially free of any AM variation due to the non-constant envelope.

5. (Currently Amended) A power detector/controller for wireless handsets that use a modulation scheme having a non-constant amplitude envelope, as per claim 4, wherein the variable gain amplifier is operatively coupled to the input demodulating detector via an AC - coupling capacitor that removes any DC component in the AM variation signal.

6. (Original) A power detector/controller for wireless handsets that use a modulation scheme having a non-constant amplitude envelope, as per claim 2, wherein the summing junction comprises:

a variable gain amplifier operatively coupled to the input demodulating detector to receive the AM variation signal and adjust the amplitude of the AM variation signal;

a multiplication node to multiply the AM variation signal from the variable gain amplifier with the ramp control signal to produce a composite AM variation/ramp control signal; and

a differential amplifier to receive the feedback signal on a negative input and to receive the composite signal on a positive input, the differential amplifier having a filter capacitor connected between the negative input and an output of the differential amplifier, the differential

amplifier producing the power amplifier control signal that is substantially free of any AM variation due to the non-constant envelope from the composite signal and ramp control signal.

7. (Currently Amended) A power detector/controller for wireless handsets that use a modulation scheme having a non-constant amplitude envelope, as per claim 6, wherein the variable gain amplifier is operatively coupled to the input demodulating detector via an æAC - coupling capacitor that removes any DC component in the AM variation signal.

8. (Original) A power detector/controller for wireless handsets that use a modulation scheme having a non-constant amplitude envelope, as per claim 2, wherein the input and output demodulating detectors are logarithmic detectors and the summing junction comprises:

a sum node operatively coupled to the input demodulating detector to add the AM variation signal with the ramp control signal to produce a composite AM variation/ramp control signal; and

a differential amplifier to receive the feedback signal on a negative input and to receive the composite signal on a positive input, the differential amplifier having a filter capacitor connected between the negative input and an output of the differential amplifier, the differential amplifier producing the power amplifier control signal that is substantially free of any AM variation due to the non-constant envelope from the composite signal and ramp control signal.

9. (Currently Amended) A power detector/controller for wireless handsets that use a modulation scheme having a non-constant amplitude envelope, as per claim 8, wherein the sum node is operatively coupled to the input demodulating detector via an æAC -coupling capacitor that removes any DC component in the AM variation signal.

10. (Original) A power detector/controller for wireless handsets that use a modulation scheme having a non-constant amplitude envelope, as per claim 2, wherein the input and output demodulating detectors are logarithmic detectors and the summing junction comprises:

a low pass filter to filter the feedback signal;

an operational amplifier to receive the filtered feedback signal on a negative input and to receive the ramp control signal on a positive input, the differential amplifier producing a gain error signal from the filtered feedback signal and ramp control signal;

a sum node to combine the AM variation signal, the feedback signal from the output demodulating detector, and the gain error signal to produce a combined signal substantially free of any AM variation due to the non-constant envelope; and

an error amplifier/integrator to receive the combined signal and produce the power amplifier control signal substantially free of any AM variation due to the non-constant envelope from the composite signal and ramp control signal.

11. (Original) A power detector/controller for wireless handsets that use a modulation scheme having a non-constant amplitude envelope, as per claim 1, wherein the wireless handsets also use a modulation scheme having a constant amplitude envelope.

12. (Original) A wireless handset for a mobile communication system that uses a modulation scheme having a non-constant amplitude envelope, the wireless handset comprising:

a power detector/controller to control the power level of output RF bursts, the power detector/controller comprising:

a power amplifier having an input to receive a input signal with non-constant amplitude envelope and an output to output an amplified input signal, wherein either output power or gain of the power amplifier is controlled by a power amplifier control signal;

an output demodulating detector coupled to the output of the power amplifier to generate a feedback signal proportional to the amplified input signal's power, the feedback signal including an AM variation due to the non-constant amplitude envelope;

a summing junction to receive the feedback signal, a ramp control signal that indicates either a target gain or target output power of the power amplifier, and an AM variation signal that represents the AM variation in the power of the input signal due to the non-constant amplitude envelope; and

the summing junction combining the feedback signal, the ramp control signal and AM variation signal to produce the power amplifier control signal such that the power amplifier control signal substantially free of any AM variation due to the non-constant envelope.

13. (Original) A wireless handset for a mobile communication system that uses a modulation scheme having a non-constant amplitude envelope, as per claim 12, further comprising:

an input demodulating detector coupled to the input of the power amplifier to generate the AM variation signal received by the summing junction.

14. (Original) A wireless handset for a mobile communication system that uses a modulation scheme having a non-constant amplitude envelope, as per claim 13, wherein the input demodulating detector is coupled to the input via a phase shifter.

15. (Original) A wireless handset for a mobile communication system that uses a modulation scheme having a non-constant amplitude envelope, as per claim 13, wherein the summing junction comprises:

a variable gain amplifier operatively coupled to the input demodulating detector to receive the AM variation signal and adjust the amplitude of the AM variation signal;

a differential amplifier to receive the feedback signal on a negative input and to receive the ramp control signal on a positive input, the differential amplifier having a filter capacitor connected between the negative input and an output of the differential amplifier, the differential amplifier producing an error signal from the feedback signal and ramp control signal; and

a sum node to receive the AM variation signal from the variable gain amplifier and to receive the error signal, the sum node combining the received AM variation signal and error

signal to produce the power amplifier control signal that is substantially free of any AM variation due to the non-constant envelope.

16. (Currently Amended) A wireless handset for a mobile communication system that uses a modulation scheme having a non-constant amplitude envelope, as per claim 15, wherein the variable gain amplifier is operatively coupled to the input demodulating detector via an ~~æAC~~-coupling capacitor that removes any DC component in the AM variation signal.

17. (Original) A wireless handset for a mobile communication system that uses a modulation scheme having a non-constant amplitude envelope, as per claim 13, wherein the summing junction comprises:

a variable gain amplifier operatively coupled to the input demodulating detector to receive the AM variation signal and adjust the amplitude of the AM variation signal;

a multiplication node to multiply the AM variation signal from the variable gain amplifier with the ramp control signal to produce a composite AM variation/ramp control signal; and

a differential amplifier to receive the feedback signal on a negative input and to receive the composite signal on a positive input, the differential amplifier having a filter capacitor connected between the negative input and an output of the differential amplifier, the differential amplifier producing the power amplifier control signal that is substantially free of any AM variation due to the non-constant envelope from the composite signal and ramp control signal.

18. (Currently Amended) A wireless handset for a mobile communication system that uses a modulation scheme having a non-constant amplitude envelope, as per claim 17, wherein the variable gain amplifier is operatively coupled to the input demodulating detector via an ~~æAC~~-coupling capacitor that removes any DC component in the AM variation signal.

19. (Original) A wireless handset for a mobile communication system that uses a modulation scheme having a non-constant amplitude envelope, as per claim 13, wherein the input and output demodulating detectors are logarithmic detectors and the summing junction comprises:

a sum node operatively coupled to the input demodulating detector to add the AM variation signal with the ramp control signal to produce a composite AM variation/ramp control signal; and

a differential amplifier to receive the feedback signal on a negative input and to receive the composite signal on a positive input, the differential amplifier having a filter capacitor connected between the negative input and an output of the differential amplifier, the differential amplifier producing the power amplifier control signal that is substantially free of any AM variation due to the non-constant envelope from the composite signal and ramp control signal.

20. (Currently Amended) A wireless handset for a mobile communication system that uses a modulation scheme having a non-constant amplitude envelope, as per claim 19, wherein the sum node is operatively coupled to the input demodulating detector via an ac-coupling capacitor that removes any DC component in the AM variation signal.

21. (Original) A wireless handset for a mobile communication system that uses a modulation scheme having a non-constant amplitude envelope, as per claim 13, wherein the input and output demodulating detectors are logarithmic detectors and the summing junction comprises:

a low pass filter to filter the feedback signal;

a differential amplifier to receive the filtered feedback signal on a negative input and to receive the ramp control signal on a positive input, the differential amplifier producing a gain error signal from the filtered feedback signal and ramp control signal;

a sum node to combine the AM variation signal, the feedback signal from the output demodulating detector, and the gain error signal to produce a combined signal substantially free of any AM variation due to the non-constant envelope; and

an error amplifier/integrator to receive the combined signal and produce the power amplifier control signal substantially free of any AM variation due to the non-constant envelope from the composite signal and ramp control signal.

22. (Original) A wireless handset for a mobile communication system that uses a modulation scheme having a non-constant amplitude envelope, as per claim 12, wherein a modulation scheme having a constant amplitude envelope is also used.

23. (Original) An RF power amplifier module for signals having a modulation scheme with a non-constant amplitude envelope, the RF power amplifier module comprising:

a power amplifier having an input to receive a input signal with non-constant amplitude envelope and an output to output an amplified input signal, wherein either output power or gain of the power amplifier is controlled by a power amplifier control signal;

an output demodulating detector coupled to the output of the power amplifier to generate a feedback signal proportional to the amplified input signal's power, the feedback signal including an AM variation due to the non-constant amplitude envelope;

a summing junction to receive the feedback signal, a ramp control signal that indicates either a target gain or target output power of the power amplifier, and an AM variation signal that represents the AM variation in the power of the input signal due to the non-constant amplitude envelope; and

the summing junction combining the feedback signal, the ramp control signal and AM variation signal to produce the power amplifier control signal such that the power amplifier control signal substantially free of any AM variation due to the non-constant envelope.

24. (Original) An RF power amplifier module for signals having a modulation scheme with a non-constant amplitude envelope, as per claim 23, further comprising:

an input demodulating detector coupled to the input of the power amplifier to generate the AM variation signal received by the summing junction.

25. (Original) An RF power amplifier module for signals having a modulation scheme with a non-constant amplitude envelope, as per claim 24, wherein the input demodulating detector is coupled to the input via a phase shifter.

26. (Original) An RF power amplifier module for signals having a modulation scheme with a non-constant amplitude envelope, as per claim 24, wherein the summing junction comprises:

a variable gain amplifier operatively coupled to the input demodulating detector to receive the AM variation signal and adjust the amplitude of the AM variation signal;

a differential amplifier to receive the feedback signal on a negative input and to receive the ramp control signal on a positive input, the differential amplifier having a filter capacitor connected between the negative input and an output of the differential amplifier, the differential amplifier producing an error signal from the feedback signal and ramp control signal; and

a sum node to receive the AM variation signal from the variable gain amplifier and to receive the error signal, the sum node combining the received AM variation signal and error signal to produce the power amplifier control signal that is substantially free of any AM variation due to the non-constant envelope.

27. (Currently Amended) An RF power amplifier module for signals having a modulation scheme with a non-constant amplitude envelope, as per claim 26, wherein the variable gain amplifier is operatively coupled to the input demodulating detector via an AC-coupling capacitor that removes any DC component in the AM variation signal.

28. (Original) An RF power amplifier module for signals having a modulation scheme with a non-constant amplitude envelope, as per claim 24, wherein the summing junction comprises:

a variable gain amplifier operatively coupled to the input demodulating detector to receive the AM variation signal and adjust the amplitude of the AM variation signal;

a multiplication node to multiply the AM variation signal from the variable gain amplifier with the ramp control signal to produce a composite AM variation/ramp control signal; and

a differential amplifier to receive the feedback signal on a negative input and to receive the composite signal on a positive input, the differential amplifier having a filter capacitor connected between the negative input and an output of the differential amplifier, the differential amplifier producing the power amplifier control signal that is substantially free of any AM variation due to the non-constant envelope from the composite signal and ramp control signal.

29. (Currently Amended) An RF power amplifier module for signals having a modulation scheme with a non-constant amplitude envelope, as per claim 2821, wherein the variable gain amplifier is operatively coupled to the input demodulating detector via an ~~æ~~AC-coupling capacitor that removes any DC component in the AM variation signal.

30. (Original) An RF power amplifier module for signals having a modulation scheme with a non-constant amplitude envelope, as per claim 24, wherein the input and output demodulating detectors are logarithmic detectors and the summing junction comprises:

a sum node operatively coupled to the input demodulating detector to add the AM variation signal with the ramp control signal to produce a composite AM variation/ramp control signal; and

a differential amplifier to receive the feedback signal on a negative input and to receive the composite signal on a positive input, the differential amplifier having a filter capacitor connected between the negative input and an output of the differential amplifier, the differential amplifier producing the power amplifier control signal that is substantially free of any AM variation due to the non-constant envelope from the composite signal and ramp control signal.

31. (Currently Amended) An RF power amplifier module for signals having a modulation scheme with a non-constant amplitude envelope, as per claim 3049, wherein the sum node is operatively coupled to the input demodulating detector via an ~~æ~~AC-coupling capacitor that removes any DC component in the AM variation signal.

32. (Original) An RF power amplifier module for signals having a modulation scheme with a non-constant amplitude envelope, as per claim 24, wherein the input and output demodulating detectors are logarithmic detectors and the summing junction comprises:

- a low pass filter to filter the feedback signal;
- a differential amplifier to receive the filtered feedback signal on a negative input and to receive the ramp control signal on a positive input, the differential amplifier producing a gain error signal from the filtered feedback signal and ramp control signal;
- a sum node to combine the AM variation signal, the feedback signal from the output demodulating detector, and the gain error signal to produce a combined signal substantially free of any AM variation due to the non-constant envelope; and
- an error amplifier/integrator to receive the combined signal and produce the power amplifier control signal substantially free of any AM variation due to the non-constant envelope from the composite signal and ramp control signal.

33. (Original) An RF power amplifier module for signals having a modulation scheme with a non-constant amplitude envelope, as per claim 23, wherein a modulation scheme having a constant amplitude envelope is also used.